

## WHAT IS CLAIMED IS:

1. A print control apparatus having a function for temporarily saving output intermediate data of document data in accordance with a document data print instruction, comprising:
  - an image data generator configured to generate image data on the basis of the temporarily saved intermediate data;
  - a previewer configured to , when display of a print image of the document data is designated by the print instruction, issue an image generation request in accordance with the print instruction, and displaying a preview window representing the print image of the document data on the basis of acquired preview display information; and
  - a processing controller configured to control said image data generator so as to generate the image data in response to issuing of the image generation request, notifying said previewer of the preview display information based on the generated image data, and thus controlling said previewer so as to display a preview representing the print image.
2. The apparatus according to claim 1, wherein the image generation request issued by said previewer includes designation information on a size or resolution of image data to be generated, and said processing controller controls said image

data generator so as to generate the image data at the size or resolution designated by the designation information.

3. The apparatus according to claim 1, wherein  
5 the image generation request issued by said previewer includes page number information on a total number of pages of image data to be generated, and said processing controller controls said image data generator so as to generate image data  
10 corresponding to a page number designated by the page number information.
4. The apparatus according to claim 1, wherein the image generation request issued by said previewer includes the number of colors used for bitmap data  
15 stored in a print image file, or a subtractive process used to create the bitmap data.
5. The apparatus according to claim 1, wherein said processing controller creates a designated number of files for saving the image data generated by  
20 said image data generator, and stores the preview display information based on the generated image data in the file, and  
when preview display is designated by the print instruction and preview display information  
25 corresponding to the designated print image is stored in the file, said previewer displays the preview window representing the print image on the basis of the

information read out from the file.

6. The apparatus according to claim 1, wherein when said previewer issues an inquiry about whether print data to be printed is temporarily saved as intermediate data, said processing controller sends a reply to the inquiry.

7. The apparatus according to claim 6, wherein when said previewer issues an inquiry about a total number of pages in actually printing the target document data, said processing controller sends a reply to the inquiry.

8. The apparatus according to claim 1, wherein said processing controller so controls as to generate the image data by said image data generator on the basis of the temporarily saved intermediate data in accordance with a print start request, and controls a printing apparatus so as to print on the basis of the generated image data.

9. A print control apparatus which operates by a printer driver that supplies print data to a printing apparatus, comprising:

a print setting unit which designates whether to display a print image of document data on a screen;

a page processor configured to generate print page data in accordance with a processing sequence of pages of the print data on the basis of setting by said print setting unit;

an image generation processor configured to  
generate bitmap data of the print page data; and

a print image display configured to display the  
bitmap data as the print image and switch a print image  
5 page to be displayed in accordance with a user input  
operation,

wherein when display designation of the print  
image is set by said print setting unit, the print page  
data is generated by said page processor in accordance  
10 with a request from said print image display, the  
bitmap data generated by said image generation  
processor using the generated print page data is stored  
in a print image file, and said print image display  
displays the print image on the screen by using the  
15 print image file.

10. A print control apparatus comprising:

a user interface driver which starts operation in  
response to notification of a print event from a print  
function of an operating system that interprets a print  
20 command issued by an application program;

a print processor which arranges print data of  
pages of print document data issued by the application  
program in a page description language for each page;

a previewer which starts operation in response to  
25 activation by said print processor; and

a printer graphic driver which generates image  
data,

wherein said print processor activates said  
previewer in accordance with a driver property set  
along with acquisition of a print request for the print  
document data created by the application program,  
5 processes each page of the print document data to  
create print page data, and supplies the print page  
data to said printer graphic driver,

said printer graphic driver stores, in a print  
image file, image data generated on the basis of the  
10 supplied print page data, and

said previewer displays the image data stored in  
the print image file on a screen.

11. A print control method of displaying a preview  
representing a print image of document data in  
15 accordance with a document data print instruction,  
comprising:

a generation step of, when display of a print  
image of the document data is designated by the print  
instruction, causing image data generator to generate  
20 image data on the basis of output intermediate data of  
temporarily saved document data in accordance with the  
print instruction; and

a display step of displaying the generated image  
data on a display.

25 12. The method according to claim 11, wherein in the  
generation step, the image data generator generates the  
image data at a designated size or resolution.

13. The method according to claim 11, wherein in the generation step, the image data generator generates image data corresponding to a page number designated by a total number of pages to be printed as an image data generation object based on the intermediate data.
14. The method according to claim 11, wherein in the generation step, the image data generator generates the image data by a designated number of colors or a subtractive process used to create bitmap data.
15. The method according to claim 11, wherein in the generation step, a designated number of files for saving the image data generated by the image data generator are created to store the generated image data in the file, and
- in the display step, when image data corresponding to a preview display-designated print image is stored in the file, a preview window representing the print image is displayed on the basis of the image data read out from the file.
16. A computer program for print control which runs in an operating system environment having an output intermediate data spool function in a computer, comprising:
- a program code for an image data generation function of generating image data on the basis of intermediate data spooled by the spool function;
  - a program code for a preview function of, when

display of a print image of document data is designated  
by a print instruction, issuing an image generation  
request in accordance with the print instruction, and  
displaying a preview window representing the print  
5 image of the document data on the basis of acquired  
preview display information; and

a program code for a processing control function  
of controlling the image generation function so as to  
generate the image data in response to issuing of the  
10 image generation request, and controlling the preview  
function so as to display a preview representing the  
print image by notifying the preview function of the  
preview display information based on the generated  
image data.

15 17. The program according to claim 16, wherein  
the image generation request issued by the  
preview function includes designation information on a  
size or resolution of image data to be generated, and  
the program code for the processing control  
20 function is executed to control the image data  
generation function so as to generate the image data at  
the size or resolution designated by the designation  
information.

18. The program according to claim 16, wherein  
25 the image generation request issued by the  
preview function includes page number information on a  
total number of pages of image data to be generated,

and

the program code for the processing control function is executed to control the image data generation function so as to generate image data  
5 corresponding to a page number designated by the page number information.

19. The program according to claim 16, wherein the image generation request issued by the preview function includes the number of colors used for bitmap data  
10 stored in a print image file, or a subtractive process used to create the bitmap data.

20. The program according to claim 16, wherein  
the program code for the processing control function is executed to create a designated number of  
15 files for saving the image data generated by the image data generation function, and store the preview display information based on the generated image data in the file, and

the program code for the preview function is  
20 executed to, when preview display is designated by the print instruction and preview display information corresponding to the designated print image is stored in the file, display the preview window representing the print image on the basis of the information read  
25 out from the file.

21. The program according to claim 16, wherein the program code for the processing control function is



executed to, when the preview function issues an inquiry about whether print data to be printed is temporarily saved as intermediate data, send a reply to the inquiry.

5 22. The program according to claim 21, wherein the program code for the processing control function is executed to, when the preview function issues an inquiry about a total number of pages in actually printing the target document data, send a reply to the  
10 inquiry.

23. The program according to claim 16, wherein the program code for the processing control function is executed to control so as to generate the image data by the image data generation function on the basis of the  
15 temporarily saved intermediate data in accordance with a print start request, and control a printing apparatus so as to print on the basis of the generated image data.

24. A computer-readable storage medium which stores  
20 codes of a computer program defined in claim 16.

25. A preview apparatus comprising:  
a preview image generator configured to generate a preview image stored in a creation preview file;  
a previewer configured to display the preview  
25 image stored in a reference file; and  
a replacement unit configured to store the preview image generated by said preview image generator

in the creation preview file, and then replacing a content of the reference preview file designated by said previewer with a content of the creation preview file.

- 5    26.    A preview method using a creation preview file which stores a preview image created by preview image generator and a reference file which stores a preview image displayed by previewer, comprising:

          a replacement step of storing the preview image  
10    created by the preview image generator in the creation preview file, and then replacing a content of the reference preview file designated by the previewer with a content of the creation preview file.

27.    A computer program which generates an operation  
15    instruction to cause a computer to display a preview, comprising:

          a program code for a preview image creation function of creating a preview image stored in a creation preview file;

- 20           a program code for a preview function of displaying the preview image stored in a reference file; and

          a program code for a replacement function of storing the preview image created by the preview image  
25    creation function in the creation preview file, and then replacing a content of the reference preview file designated by the preview function with a content of

the creation preview file.

28. A printer driver which supplies print data to a printing apparatus, comprising:

5 a previewer configured to display a preview on the basis of print data which is supplied from an application and spooled by a standard spool function of an operating system.

29. A printer driver preview method of displaying a preview on the basis of print data which is supplied  
10 from an application and spooled by a standard spool function of an operating system.

30. A print processor which is activated in response to storage of data supplied from an application in a spool file, comprising:

15 a determination unit configured to determine whether a preview is set;

a notification unit, when said determination unit determines that no preview is set, configured to notify a printer graphic driver which generates print data to  
20 be transmitted to a printer, of start of printing; and

an activator, when said determination unit determines that the preview is set, configured to activate a previewer for displaying the preview.

31. A preview method by a print processor which is  
25 activated in response to storage of data supplied from an application in a spool file, comprising:

a determination step of determining whether a

preview is set;

a notification step of, when no preview is determined to be set in the determination step, notifying a printer graphic driver which generates  
5 print data to be transmitted to a printer, of start of printing; and

an activation step of, when the preview is determined to be set in the determination step, activating a previewer for displaying the preview.  
10 32. A control program executed by a print processor which is activated in response to storage of data supplied from an application in a spool file, comprising:

a program code for a determination function of  
15 determining whether a preview is set;

a program code for a notification function of, when no preview is determined to be set by the determination function, notifying a printer graphic driver which generates print data to be transmitted to  
20 a printer, of start of printing; and

a program code for an activation function of, when the preview is determined to be set by the determination function, activating a previewer for displaying the preview.

25 33. A print image preview method comprising:

a step of activating a previewer when a print processor is activated by a spooler;

a step of generating a preview file in accordance with a print image generation request from the activated previewer;

a step of writing image data in the generated  
5 preview file; and

a step of reading out the image data from the preview file and displaying a preview.

34. A computer program product comprising:

a code for realizing a step of activating a  
10 previewer in response to activation of a spooler;

a code for realizing a step of generating a preview file in accordance with a print image generation request from the activated previewer; and

a code for realizing a step of designating a  
15 preview file name in order to read out image data written in the generated preview file and display a preview.